NON-PUBLIC?: N
ACCESSION #: 9007090202
LICENSEE EVENT REPORT (LER)

FACILITY NAME: Braidwood 1 PAGE: 1 OF 3

DOCKET NUMBER: 05000456

TITLE: Reactor Trip due to Lightning Induced Voltage Transient in the Rod Control System.
EVENT DATE: 06/08/90 LER #: 90-008-00 REPORT DATE: 07/02/90

OTHER FACILITIES INVOLVED: NONE DOCKET NO: 05000

OPERATING MODE: 1 POWER LEVEL: 100

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR SECTION:
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:
NAME: R. Zagrzebski Ext. 2276 TELEPHONE: (815) 458-2801

COMPONENT FAILURE DESCRIPTION:
CAUSE: SYSTEM: COMPONENT: MANUFACTURER:
REPORTABLE NPRDS:

SUPPLEMENTAL REPORT EXPECTED: NO

ABSTRACT:

On June 8, 1990 there was heavy thunderstorm activity in the Braidwood Station area. At 0618 a reactor trip occurred on Unit 1 due to a high flux rate trip signal from the Power Range Nuclear Instrumentation. The Reactor Operators verified all automatic actions. All systems functioned as designed. Stable plant conditions were immediately established. An examination of the Rod Drive (RD) Power Cabinets indicated the power supply over voltage protectors (PSOVP) had tripped in three of the RD Cabinets. There were no blown fuses identified in any of the cabinets. The PSOVP's were reset and all voltages were checked. The root cause of this event was a voltage transient. It is believed that lightning struck the Unit 1 Containment and caused a voltage surge in the station ground system. This caused the activation of PSOVPs in the three RD Power Cabinets. This shut off the current to the stationa
y gripper coils of
the rods powered by the cabinets, and caused them to drop, resulting in a

negative flux rate. The negative flux rate was of sufficient magnitude to activate the reactor trip signal from the Power Range Nuclear Instrumentation. No damage occurred to the RD system. A review of the station lightning protection system is being conducted. The Station had made modifications to the RD power supply system and the station grounding system as corrective measures from previous events.

END OF ABSTRACT

A. PLANT CONDITIONS PRIOR TO EVENT:

Unit: Braidwood 1; Event Date: June 8, 1990; Event Time: 0618;

Mode: 1 - Power Operation; Rx Power: 100%;

RCS AB! Temperature/Pressure: NOT/NOP

B. DESCRIPTION OF EVENT:

There were no systems or components inoperable at the beginning of the event which contributed to the severity of the event.

There was heavy thunderstorm activity in the Braidwood Station area at the time of the event.

At 0618 on June 8, 1990 a Reactor Trip occurred on Unit 1 due to a high flux rate signal from the Power Range Nuclear Instrumentation (NR) IG!.

The Nuclear Station Operators (Licensed Reactor Operators) verified all automatic actions. All systems functioned as designed. Stable plant conditions were immediately established.

An examination of the Rod Drive (RD) AA! Power Cabinets indicated the following:

1RD02J (SCDE) - Urgent alarm
1RD03J (28D) - Urgent alarm
1RD04J (2AC) - No alarms, both +24 VDC Power Supply (PS) Over Voltage Protectors (OVP) tripped
1RD05J (1BD) - Non-urgent alarm, with one PS OVP tripped
1RD06J (1AC) - No alarms, both +24 VDC PS OVP's tripped

There were no blown fuses identified in any of the cabinets. The PS

OVPs were reset and all voltages were checked.

The Unit 2 RD Power Cabinets were inspected. They were not affected by this event.

The appropriate NRC notification via the ENS phone system was made at 0815 pursuant to 10CFR50.72(b)(2)(ii).

This event is being reported pursuant to 10CFR50.73 (a)(2)(iv) - any event or condition that resulted in manual or automatic actuation of any Engineered Safety Feature, including the Reactor Protection System.

C. CAUSE OF EVENT:

The root cause of this event was a voltage transient. It is believed that lightning struck the Unit 1 Containment and caused a voltage surge in the station ground system. This caused activation of the +24 VDC PS OVPs in the 1AC and 2AC RD Power Cabinets which shut off the current to the stationary gripper coils of Shutdown Bank A and Control Bank A & C. This caused the control rods to drop which resulted in a negative flux rate. The negative flux rate was of sufficient magnitude to activate the reactor trip signal from the Power Range Nuclear Instrumentation.

The exact location of the lightning strikes and the dissipation path is still unknown.

D. SAFETY ANALYSIS:

This event had no effect on the safety of the plant or the public. All systems operated as designed.

Both trains of Reactor Protection and ESF were operable and performed their functions as designed.

The Unit was operating at 100% power which is the worst case condition for this type of event. The RD system is designed to be inherently safe as rod insertion results on loss of power as was the case in this event.

E. CORRECTIVE ACTIONS:

The immediate corrective actions were to reset the PS OVPs and

verify RD system operability. No damage occurred to the RD system.

Commonwealth Edison Engineering, Sargent & Lundy, and Westinghouse are conducting a review of the station lightning protection system. Further investigation and implementation of a lightning protection system is in progress. The results of this investigation will be tracked to completion by action item no. 456-200-90-02301.

F. PREVIOUS OCCURRENCES:

There have been three previous occurrences of a lightning induced voltage transient resulting in a reactor trip.

DVR Number Title

20-1-88-240/88-023 Instrument Failures on Unit 1 and Reactor Trip on Unit 2 as a Result of Lightning Induced Voltage Transients

20-1-89-104/89-006 Unit 1 and Unit 2 Reactor Trip as a Result of Lightning Induced Voltage Transients Affecting the Rod Control System

20-2-89-075/89-004 Reactor Trip as a Result of Lightning Induced Voltage Transients Affecting the Rod Control System.

The Station had increased the time delay on the PS OVPs and improved the station grounding system as corrective actions from previous events.

G. COMPONENT FAILURE DATA:

This event was not the result of component failure, nor did any components fail as a result of this event.

ATTACHMENT 1 TO 9007090202 PAGE 1 OF 1

Commonwealth Edison
Braidwood Nuclear Power Station
Route #1, Box 84
Braceville, Illinois 60407
Telephone 815/458-2801

June 29, 1990
BW/90-0671

U. S. Nuclear Regulator Commission
Document Control Desk
Washington, D.C. 20555

Dear Sir:

The enclosed Licensee Event Report from Braidwood Generating Station is being transmitted to you in accordance with the requirements of 10CFR50.73(a)(2)(iv) which requires a 30-day written report.

This report is number 90-008-00; Docket No. 50-456.

Very truly yours,

R. E. Querio
Station Manager
Braidwood Nuclear Station

REQ/JDW/sjs
(7126z)

Enclosure: Licensee Event Report No. 90-008-00

cc: NRC Region III Administrator
NRC Resident Inspector
INPO Record Center
CECo Distribution List

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